

WHAT IS CLAIMED IS:

1. A mobile telecommunication system, which provides plural radio base stations having a respective individual service area, plural mobile telecommunication terminals existing in said service areas, and a radio base station controller that controls said plural radio base stations, and provides telecommunication service to said plural mobile telecommunication terminals, wherein:

at the case that one of said plural mobile telecommunication terminals is in a service area overlapped said plural service areas of said plural radio base stations, and plural radio speech paths between said one of said plural mobile telecommunication terminals and said plural radio base stations, which manage their individual service areas and are the bases of the overlapped service area, are formed, said radio base station controller, comprising:

a monitoring means for monitoring FERs (frame error rates) signifying frame quality of respective upstream radio speech paths of said plural radio speech paths for said one of said plural mobile telecommunication terminals in a predetermined constant cycle; and

a judging means, which detects some radio speech paths whose FERs of said upstream radio speech paths exceeded a predetermined frame quality threshold value based on monitored results at said monitoring means, in order to judge that speech quality of several upstream radio speech paths in all said plural radio speech paths using between said one of said plural mobile telecommunication terminals and said plural radio base stations can be sufficiently secured, and removes said upstream radio speech paths, whose FERs exceeded said frame quality threshold value, from said plural radio speech paths using between said one of said plural mobile telecommunication terminals and said plural radio base stations, and selects the best frames from said upstream radio speech paths removed radio speech paths exceeded said

- 30 frame quality threshold value, and judges whether said upstream radio speech paths of said one of said plural mobile telecommunication terminals can be secured or not by using the measured result of said FERs from said selected best frames.

2. A mobile telecommunication system in accordance with claim 1, wherein:

said radio base station controller, further comprising:

- a storing means for storing information of said upstream radio
5 speech paths whose FERs exceeded said frame quality threshold value in a designated table, when upstream radio speech quality of said one of said plural mobile telecommunication terminals is judged to be able to secure even if said upstream radio speech paths whose FERs exceeded said frame quality threshold value are removed from all said upstream
10 radio speech paths using between said one of said plural mobile telecommunication terminals and said plural radio base stations.

3. A mobile telecommunication system in accordance with claim 2, wherein:

said radio base station controller, further comprising:

- a speech level confirming means for confirming speech levels of
5 downstream radio speech paths of remaining all said radio speech paths removed said radio speech paths whose FERs exceeded said frame quality threshold value by referring to said designated table by electric field strength of pilot signals transmitted from said plural radio base stations connected to said one of said plural mobile telecommunication
10 terminals, when said designated table in said storing means, which stores said information of said upstream radio speech paths whose FERs exceeded said frame quality threshold value, is renewed; and
a control means for judging that the downstream radio speech

level of said one of said plural mobile telecommunication terminals can
 15 be secured even if said radio speech paths whose FERs exceeded said
 frame quality threshold value are removed, at the case that at least one
 radio speech path whose electric field strength of said pilot signal
 exceeded a predetermined speech level threshold value exists in said
 downstream radio speech paths.

4. A mobile telecommunication system in accordance with
 claim 3, wherein:

said radio base station controller, further comprising:

a radio speech path dropping means for dropping said radio
 5 speech paths whose FERs exceeded said frame quality threshold value as
 a hand-off based on said information of said radio speech paths whose
 FERs exceeded said frame quality threshold value stored in said
 designated table in said storing means, by judging that said downstream
 radio speech path of said one of said plural mobile telecommunication
 10 terminals can be secured even if said radio speech paths whose FERs
 exceeded said frame quality threshold value are removed, at the case
 that at least one radio speech path whose electric field strength of said
 pilot signal exceeded said predetermined speech level threshold value
 exists in said remaining downstream radio speech paths, excluded said
 15 radio speech paths whose FERs exceeded said frame quality threshold
 value, using between said one of said plural mobile telecommunication
 terminals and said plural radio base stations.

5. A mobile telecommunication system, which provides plural
 radio base stations having a respective individual service area, plural
 mobile telecommunication terminals existing in said service areas, and a
 radio base station controller that controls said plural radio base stations,
 5 and provides telecommunication service to said plural mobile

telecommunication terminals, wherein:

said radio base station controller, comprising:

a signal transmitter and receiver that transmits and receives information regarding speech signals and control signals to and from
10 said plural radio base stations through respective wire transmission lines;

a radio speech path controller that memorizes a predetermined frame quality threshold value for securing speech quality and monitors FERs of respective upstream radio speech paths of plural radio speech
15 paths through said signal transmitter and receiver in a predetermined cycle, and compares said monitored FERs with said frame quality threshold value, and outputs said compared results, in order to control said plural radio speech paths at the case that said plural radio speech paths are established between one of said plural mobile
20 telecommunication terminal in a service area overlapped said service areas and said plural radio base stations managing the respective service areas that are bases of said overlapped service area;

a controller that memorizes a predetermined speech level threshold value, and compares electric field strength of pilot signals of
25 downstream radio speech paths of said plural radio speech paths with said predetermined speech level threshold value in order to secure speech quality, only when radio speech paths whose FERs exceeded said frame quality threshold value exist in said plural radio speech paths at said compared results at said radio speech path controller, and decides
30 that a radio speech path whose FER is the worst is as a hand-off by the jointed compared results of said compared result of said FERs at said radio speech path controller and said compared result of said electric field strength at said controller, and outputs said decided result;

radio speech path information storage that memorizes the
35 using state of said plural radio speech paths in a designated table in a

time series by the control of said controller; and

a control signal controller that transmits a control signal signifying the hand-off to radio base stations having a radio speech path that is decided to be hand-off at said controller through said signal
 40 transmitter and receiver.

6. A hand-off method of radio speech paths at a mobile telecommunication system, which provides plural radio base stations having a respective individual service area, plural mobile telecommunication terminals existing in said service areas, and a radio
 5 base station controller that controls said plural radio base stations, and provides telecommunication service to said plural mobile telecommunication terminals, wherein:

said radio base station controller, comprising the steps of:

at the case that plural radio speech paths are established
 10 between one of said plural mobile telecommunication terminal in a service area overlapped said service areas and said plural radio base stations managing the respective service areas that are bases of said overlapped service area,

monitoring upstream speech quality of upstream radio speech
 15 paths of plural radio speech paths for said one of said plural mobile telecommunication terminals by their FERs in a predetermined cycle;

comparing said monitored FERs with a predetermined frame quality threshold value;

selecting the best frames of upstream radio speech paths
 20 whose FERs did not exceed said predetermined frame quality threshold value when said FERs of some of said upstream radio speech paths exceeded said predetermined frame quality threshold value;

judging that radio speech path quality of said upstream radio speech paths of said one of said plural mobile telecommunication

25 terminals can be secured by the measured result of said FERs from said selected frames;

storing information of said radio speech paths whose FERs exceeded said frame quality threshold value in a designated table;

30 monitoring downstream speech levels of downstream radio speech paths of said plural radio speech paths excluded said radio speech paths whose FERs exceeded said frame quality threshold value for said one of said plural mobile telecommunication terminals by measuring electric field strength of pilot signals transmitted from said plural radio base stations only when a radio speech path whose FER exceeded said
35 frame quality threshold value exists;

comparing said electric field strength of said pilot signals of remaining plural radio speech paths excluded said radio speech paths whose FERs exceeded said frame quality threshold value with a predetermined speech level threshold value;

40 judging that the downstream radio speech level of said one of said plural mobile telecommunication terminals can be secured even if said radio speech paths whose FERs exceeded said frame quality threshold value are removed, at the case that at least one radio speech path whose electric field strength of said pilot signal exceeded said
45 predetermined speech level threshold value exists in said downstream radio speech paths; and

dropping said radio speech paths whose FERs exceeded said frame quality threshold value as said hand-off, based on said information stored in said designated table.